

**Notice of Allowability**

Application No.

10/733,204

Examiner

Andrew C Flanders

Applicant(s)

MALLINSON, ANDREW MARTIN

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Case # 10/733,204 filed on 9 December 2003.
2. ☒ The allowed claim(s) is/are 1-8.
3. ☒ The drawings filed on 09 December 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

## DETAILED ACTION

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with David Stephens of the Stephens Law Group on 9/22/04.

In Claim 5 (line 3) delete "is" before "varies exponentially"

In Claim 7 (line 12) change "signal y2)" to --signal (y2)--

In Claim 8 (line 1) change "Claim 6" to --Claim 7—

In the Specification add a Brief Description of Drawings as follows:

#### Brief Description of the Drawings

Figure 1 is a diagrammatic view of one embodiment of the invention illustrating a high pass filter derived as an infinite impulse response ("IIR") filter.

Figure 2 is a graphical representation of the output of the high pass filter of Figure 1, where the values are plotted to illustrate the output as an exponential decay.

Figure 3 is a graphical representation of an output of the high pass filter of Figure 1, where the y-axis is measured in decibels relative to the initial input results to demonstrates that the circuit implements both parts of the required functionality.

***Allowable Subject Matter***

2. Claim 1 is allowed.
3. The following is an examiner's statement of reasons for allowance:
4. Regarding Claim 1, Hendrickson (U.S. Patent 5,276,678) discloses sequentially inputting digital signals of each time slot into a register (col. 33 lines 22 and 23) (i.e. a register configured to receive previous and subsequent samples of an input stream). Brooks (U.S. Patent 5,615,234) discloses a digital high pass filter (col. 1 lines 65 and 66) that has a signal output that exponentially decays to zero (col. 3 lines 52 – 54) (i.e. digital filter configured to process the input stream and wherein the output of the digital filter is a series of exponentially decaying waveforms). It is inherent that the time constant of this filter could be altered in such a manner that by the time a new sample arrived at the filter, the previous sample would have exponentially decayed to zero (i.e. processes a previous input sample during a time interval before a subsequent input sample, wherein, by the time that the subsequent input sample arrives to the digital filter, the previous sample has been suppressed by the digital filter to essentially zero). While all elements of claim 1 are clearly listed above in the two sources, one of ordinary skill in the art at the time of the invention would not have had sufficient motivation to

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combine said elements in such a fashion as applicant's said invention. Furthermore Peterson (U.S. Patent 6,678,382) and Gonzalez (U.S. Patent Application Publication 2003/0182109) disclose similar inventions that solve the same problem. However, the problem is solved in a different manner. Peterson's invention is a digital attenuator that includes a method of calculating a logarithmic audio volume output. Peterson does not disclose processing subsequent samples and by the time the following samples arrive at the processing, reducing the samples to essentially zero as applicant has. Peterson uses a logarithmic lookup table to shift (i.e. divide) the input signals and add them together thereby producing a logarithmically attenuated signal. The amount of the shift is determined by a user input. Therefore, while the applicant and Peterson are digitally attenuating an audio output signal in similar ways, there are significant differences to produce two distinct inventions. Gonzales' said invention is also similar to applicant's said invention. Gonzales' invention is a Digital audio system and Method therefor. Gonzales discloses a digital volume control (reference 14 in fig.1) and shows the digital volume control in two different embodiments (figures 2 and 3). Gonzales shows two digital attenuators that include feedback, however, the difference between applicant's said invention and Gonzales' invention is with the attenuation means. Applicant discloses processing subsequent samples, and by the time the following samples arrive at the processing, reducing the samples to essentially zero while Gonzales uses feedback w/ attenuation by multiplication. Applicant does not claim to attenuate the signal through multiplication. The advantage of eliminating multiplication greatly reduces costly computational times. Therefore applicant has a distinctly different

invention with a known advantage. Because the prior art does not provide sufficient motivation for combining the above said elements nor does the prior art make the invention obvious, Claim 1 is allowable.

5. Claims 2 and 3 are allowable based upon dependence of an allowable claim, claim 1.

6. Claim 4 is allowed.

7. The following is an examiner's statement of reasons for allowance:

8. Regarding Claim 4, Peterson discloses an audio signal processed by a digital attenuator (i.e. receiving an original input data stream). Brooks further discloses calculating a high pass output sample by subtracting the low-pass filter output value from the current input sample (col. 7 lines 11 – 14) (i.e. generating a new stream of audio data by sampling the output of a high pass filter operating between samples of the original input data stream) and as stated above regarding Claim 1, it is inherent that the time constant of this high pass filter could be altered in such a manner that by the time a new sample arrived at the filter, the previous sample would have exponentially decayed to zero (i.e. wherein the time constant of the high pass filter is configured such that the original sample has decayed to essentially zero before a subsequent sample arrives). Peterson further discloses a "settling time" consisting of "n" bit shift times, plus the "m" bit shift time (col. 4 lines 34 and 35). The terms n and m are linearly adjustable. Their values range from 1 to 16 and are stored in the table (Table 1 col. 6). The values of m and n are adjustable through a volume control knob or other device (col. 4 lines 50 – 53) (i.e. linearly varying the duration of time of the output sample relative to the input

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sample with a user input parameter). Raynauld further discloses a single-pole, infinite impulse response (IIR) digital high pass filter (col. 6 lines 32 and 33) (i.e. wherein the high pass filter is a single pole response). Peterson further discloses the n and m shifted digital signals represent the original analog signal that has been, as appropriate, repeatedly divided by 2. By adding the two fractions, a scaled value that reasonably approximates a true logarithmically attenuated value is created (col. 2 lines 62 – 66). (i.e. where the output amplitude of the high pass filter is exponential). While all elements of claim 4 are clearly listed above in the various sources, one of ordinary skill in the art at the time of the invention would not have had sufficient motivation to combine said elements in such a fashion as applicants said invention. Additionally, as stated above regarding claim 1, Peterson and Brooks disclose two similar digital attenuators that provide elements that produce the same result as Claim 4 however; the method is accomplished in a different embodiment. Neither Peterson nor Gonzales disclose varying the output exponentially based on the duration of time the sample is in the system. Therefore, because the prior art does not provide sufficient motivation for combining the above said elements nor does the prior art make the invention obvious, Claim 4 is allowable.

9. Claims 5 and 6 are allowable based upon dependence of an allowable claim, claim 4.

10. Claim 7 is allowed.

11. The following is a statement of reasons for the indication of allowable subject matter:

12. Regarding Claim 7, Peterson discloses a 16-bit amplitude signal provided at an input terminal of a shift register. A series of "n" clock pulses are produced by either a processor or a state machine and is provided serially to shift the right input terminal (col. 5 lines 6 – 9). It is inherent that this shifting, or receiving, that occurs during each clock cycle could be configured to occur on the positive edge of the clock (i.e. receiving an audio input signal in a first register (100) on the positive edge of a first clock (C1)). The prior art does not disclose adding the input signal (In) to an integrated sum signal (y3); simultaneously generating derivative input signals (from shifters 106 and 107) using shifters; adding the simultaneously generated derivative input signals to generate a sum signal (y2); integrating the sum signal (y2) to generate the integrated sum signal (y3) in an integrator loop having a register (105) and second clock (C3), where each cycle of the second clock (C3) causes the integrated sum signal (y3) to be incremented by the signal (y) value of the sum signal (y2). Because the prior art neither anticipates nor makes obvious these limitations, Claim 7 is allowable.

13. Claims 8 is allowable based upon dependence of an allowable claim, claim 7.

### ***Conclusion***

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C Flanders whose telephone number is (703) 305-0381. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forrester Isen can be reached on (703) 305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Forester W. Isen', written in a cursive style.

**FORESTER W. ISEN  
SUPERVISORY PATENT EXAMINER**